Draw a Throne: Seat, Backrest and Armrest Proportions

Original tasks 1, 2, 3 / complete keys

Task 1

A throne has seat height 4 units and backrest height 1.5 times the seat height. Calculate the total height from floor to top of backrest.

Answer: Total height = 4 + (1.5 × 4) = 4 + 6 = 10 units.

Reason: Multiply seat height by 1.5 to get backrest height, then add seat height.

Check: Verify that 6 ÷ 4 = 1.5 and that 4 + 6 = 10.

Task 2

Seat width is 2.5 units from the center line and armrest width is 3 units from the center line. Calculate the overhang on each side and the total width across armrests.

Answer: Overhang = 3 − 2.5 = 0.5 units per side. Total width across armrests = 2 × 3 = 6 units.

Reason: Subtract seat half-width from armrest half-width for overhang; double armrest half-width for total width.

Check: Check that 2.5 + 0.5 = 3 and that 3 + 3 = 6.

Task 3

In a three-quarter view, seat depth is 4 units and the depth line is drawn at 30 degrees. If the front seat width is 5 units, describe how to check that the backrest base is correctly placed.

Answer: Mark 4 units along the depth line from each front seat corner to locate the back seat line. The backrest base should sit on that line and keep the same 5-unit width and 10-unit total height as the front view.

Reason: Depth is transferred along the depth line; vertical heights and widths remain consistent between views.

Check: Measure 4 units along the depth line and confirm the backrest width and height match the front view marks.

Draw a Throne: Seat, Backrest and Armrest Proportions

Original tasks 4 / complete keys

Task 4

A student draws a throne with seat height 3 units, backrest height 6 units, seat width 2 units from center, and armrest width 2 units from center. Identify the proportion error and state a fix using a simple ratio.

Answer: The backrest ratio is 6 ÷ 3 = 2, which is steeper than the lesson example of 1.5; also armrest width equals seat width, so there is no overhang. Fix by choosing a stated ratio, for example backrest = 1.5 × seat = 4.5 units, and armrest width = seat width + 0.5 = 2.5 units from center.

Reason: Check ratios and overhang arithmetic; adjust to consistent, checkable values.

Check: Verify 4.5 ÷ 3 = 1.5 and 2.5 − 2 = 0.5.

Draw a Throne: Seat, Backrest and Armrest Proportions

Source rubric / reflection

- [ ] Seat height is marked and measurable.
- [ ] Backrest height follows a stated ratio to seat height and the arithmetic is correct.
- [ ] Armrest width is greater than seat width and the overhang is measurable.
- [ ] Front and three-quarter views use consistent vertical heights.
- [ ] Labels use the baseline-to-midline x-height convention and are legible.
- [ ] Valid alternative ratios are accepted if relationships are consistent and checkable.

Reflection: What did you check, what did you change, and what will you try next?